



Preface

Professor Neville G. W. Cook, who passed away in April, 1998, was a giant in the field of rock mechanics and mining sciences. He made significant and long-lasting contributions to this field during three phases of his professional career: in South Africa at the University of Witwatersrand and at the Chamber of Mines Mining Research Laboratory; in Minnesota at the University of Minnesota; and in Berkeley at the University of California and at Ernest Orlando Lawrence Berkeley National Laboratory.

Neville Cook's experience in the gold mines of South Africa had a major influence on subsequent work — in particular his appreciation of the energy released during rock failure and his demonstration of a spatial relation between seismicity and mining. He recognized that there were fundamental differences between brittle rock and ductile structural materials. He published several seminal papers on energy release during rockbursts and on the effects of cracks on the failure of rock. While at Minnesota he made a major contribution to rock mechanics by developing the method by which the complete stress–strain curve of rock can be obtained. At Berkeley, in addition to his continuing work on rock failure mechanics, his attention was focused on the effects of fractures on rock behavior. This was to a great extent motivated by his participation in the nuclear waste repository program at the Lawrence Berkeley National Laboratory.

In all his work, Neville Cook was gifted with the ability to rapidly distil the essential features from complex problems. He sought the simplest first order solution to address the essential physics of the problem and was able to apply this understanding to nuts-and-bolts problems, such as modification of mine support jacks and design of rock cutters.

Perhaps his most well known work to students of rock mechanics is his book “Fundamentals of Rock Mechanics” which he co-authored with John Jaeger. It was one of the first authoritative works on rock mechanics and rock engineering, and is used as a standard textbook in many universities even today. It still represents a reliable source for fundamental information and equations in rock mechanics.

Neville Cook was active in service not only to the organizations with which he was associated, but also to the general rock mechanics community. His work as a Member and subsequently as Chairman of the US National Research Council Committee on Rock Mechanics resulted in a series of four “Annual Reviews of Progress in Rock Mechanics”, and also a 220-page report entitled “Rock Mechanics Research Requirements for Resources Recovery, Construction and Earthquake Hazard Reduction” which was a definitive reference for formulating strategic research activities for many years. Furthermore, through his unselfish encouragement, suggestions, and advice to colleagues and students, Neville Cook sowed the seeds for some of the major advances in rock mechanics which have occurred over the last 35 years.

On 16–17 October, 1998, a Conference was held at the Ernest Orlando Lawrence Berkeley National Laboratory to commemorate Neville Cook's contributions to the discipline and profession of rock mechanics and mining sciences. Participants included Neville's colleagues and associates from South Africa, Europe, and Australia as well as the USA. Many of the technical papers presented at the Conference represent work to which Neville had contributed — either by inspiration or direct input. A selection of these papers constitutes this Special Issue. Further, at the Conference the technical papers were supplemented by a number of insightful, personal and historical talks of a reminiscing nature. These are presented in the article immediately following this Preface. We believe that they illustrate and convey to readers a feeling of the excitement of conducting research with Neville Cook and those who worked with him.

We are grateful to John Hudson, Editor-in-Chief of the Journal for agreeing to publish this Special Issue and for his helpful advice on its preparation. We are also appreciative of the support and encouragement from the other members of the Conference Organization Committee, Charles Fairhurst, Evert Hoek, and Miklos Salamon, and from our colleagues at the Ernest Orlando Lawrence Berkeley National Laboratory. Finally, we thank all the authors and paper reviewers

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